

IN THE CLAIMS

Please amend the claims as follows:

1. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product after the annealing but before the cleaning treatment, and wherein the gas phase purification step is carried out continuously after the gas phase etching step,

wherein the gas phase etching step is performed **so as to remove a portion of the surface layer** in a fluorine-containing gaseous atmosphere that contains at least one gas selected from the group consisting of C_xF_y , Cl_xF_y , N_xF_y , Si_xF_y , S_xF_y (where, $10 \geq x \geq 1$ and $10 \geq y \geq 1$), CHF_3 , HF , and F_2 , and

wherein the gas phase purification step comprises performing a high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

2. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas

phase etching step and a gas phase purification step are performed on a surface layer of the product after the annealing but before the cleaning treatment, and wherein the gas phase purification step is carried out simultaneously with the gas phase etching step,

wherein the gas phase etching step is performed **so as to remove a portion of the surface layer** in a fluorine-containing gaseous atmosphere that contains at least one gas selected from the group consisting of C_xF_y , Cl_xF_y , N_xF_y , Si_xF_y , S_xF_y (where, $10 \geq x \geq 1$ and $10 \geq y \geq 1$), CHF_3 , HF , and F_2 , and

wherein the gas phase purification step comprises performing a high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl .

3. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing the quartz glass jig so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product simultaneously with the annealing, and wherein the gas phase purification step is carried out continuously after the gas phase etching step,

wherein the gas phase etching step is performed **so as to remove a portion of the surface layer** in a fluorine-containing gaseous atmosphere that contains at least one gas selected from the group consisting of C_xF_y , Cl_xF_y , N_xF_y , Si_xF_y , S_xF_y (where, $10 \geq x \geq 1$ and $10 \geq y \geq 1$), CHF_3 , HF , and F_2 , and

wherein the gas phase purification step comprises performing a high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

4. (currently amended) A method for producing a quartz glass jig, said method comprising: processing a quartz glass raw material into a desired shape of the quartz glass jig by a treatment including fire working, annealing a product of the desired shape so as to remove stress therein, and performing a cleaning treatment on the product to obtain a final product, wherein a gas phase etching step and a gas phase purification step are performed on a surface layer of the product simultaneously with the annealing, and wherein the gas phase purification step is carried out simultaneously with the gas phase etching step,

wherein the gas phase etching step is performed **so as to remove a portion of the surface layer** in a fluorine-containing gaseous atmosphere that contains at least one gas selected from the group consisting of C_xF_y , Cl_xF_y , N_xF_y , Si_xF_y , S_xF_y (where, $10 \geq x \geq 1$ and $10 \geq y \geq 1$), CHF_3 , HF , and F_2 , and

wherein the gas phase purification step comprises performing a high temperature heat treatment in a temperature range of from 800 to 1300 °C in a gaseous atmosphere containing Cl.

5. (previously presented) A method for producing a quartz glass jig as claimed in Claim 1, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in the fluorine-containing gaseous atmosphere.

6. (canceled).

7. (canceled).

8. (previously presented) A method for producing a quartz glass jig as claimed in Claim 1, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

9. (previously presented) A method for producing a quartz glass jig as claimed in Claim 5, wherein the fluorine-containing gaseous atmosphere further includes a gas containing H.

10. (canceled)

11. (canceled)

12. (previously presented) A method for producing a quartz glass jig as claimed in Claim 2, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in the fluorine-containing gaseous atmosphere.

13. (canceled).

14. (canceled).

15. (previously presented) A method for producing a quartz glass jig as claimed in Claim 2, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

16. (previously presented) A method for producing a quartz glass jig as claimed in Claim 12, wherein the fluorine-containing gaseous atmosphere further includes a gas containing H.

17. (previously presented) A method for producing a quartz glass jig as claimed in Claim 3, wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in the fluorine-containing gaseous atmosphere.

18. (canceled).

19. (canceled).

20. (previously presented) A method for producing a quartz glass jig as claimed in Claim 3, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

21. (previously presented) A method for producing a quartz glass jig as claimed in Claim 17, wherein the fluorine-containing gaseous atmosphere further includes a gas containing H.

22. (previously presented) A method for producing a quartz glass jig as claimed in Claim 4,

wherein the gas phase etching step is performed in a temperature range of from 0 °C to 1300 °C in the fluorine-containing gaseous atmosphere.

23. (canceled).

24. (canceled).

25. (previously presented) A method for producing a quartz glass jig as claimed in Claim 4, wherein the gaseous atmosphere containing Cl is HCl, Cl₂, or a combination of HCl and Cl₂.

26. (currently amended) A method for producing a quartz glass jig as claimed in Claim ~~22~~ 17, wherein the fluorine-containing gaseous atmosphere further includes a gas containing H.